

REMARKS

Present Status of Patent Application

Upon entry of the amendments in this response, claims 1, 3, 5, 8, 10-13, 15, 18-31, 33, 35-45, and 47 are pending in the application. Claims 1, 15, 23, 39, 47 and 48 have been amended herein. Claim 30 has been canceled. Applicants note that support for the foregoing amendments can be found in the specification at least on page 7, lines 8-16 and page 11.

The prior art made of record has been considered, but is not believed to affect the patentability of the presently pending claims. Applicants respectfully request reconsideration and withdrawal of these objections and rejections for the reasons discussed below.

Preliminary matters

Applicants would like to thank Examiner Handy for the time spent with Applicants' attorney during the telephone interviews on October 23 and October 30, in which possible amendments to the claims were discussed.

Claim Rejections under 35 U.S.C. § 103(a)

Claims 1, 3, 5, 8, 10-13, 15, 18-31, 33, 35-45, and 47-48 have been rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over *Yaremko et al.* (hereinafter "Yaremko") (U.S. Patent No. 5,620,898) in view of *Burshteyn et al.* (hereinafter "Burshteyn") (U.S. Patent No. 6,692,702). Applicants continue to respectfully traverse the rejections.

Claim 1

Claim 1, as amended, reads in pertinent part as follows:

An immunological assay system, comprising:
a vessel capable of containing an assay sample and a reagent, wherein the vessel comprises a bottom with an uneven surface, wherein the bottom of the vessel comprises a filter material chosen from ... wherein the filter material provides the uneven bottom surface and is configured to cause reacted components to ***spread out over the uneven bottom surface while substantially preventing reacted components from passing through the filter material...***

[Emphasis added]. Applicants respectfully submit that neither Yaremko nor Burshteyn, taken alone or in combination, teach at least the highlighted portions of claim 1 above.

First, Applicants maintain that Yaremko does not teach a vessel having a bottom with an irregular surface where the bottom comprises a filter material selected from one of the recited filter

materials. Although the Office Action relies on Burshteyn for the type of filter material selected, Applicants maintain the argument that there is no motivation to combine the filter paper of Burshteyn with the assay system of Yaremko. First, Yaremko specifically teaches the use of a gel or beads to act as a filter to help separate reactants based on size (Col. 1, line 40 to Col. 2 line 15 and Col. 6 lines 21-31) by allowing the unreacted and reacted components to pass **through the bead column** for size separation (Col. 1, lines 35-67 and col. 15, line 3). Burshteyn, on the other hand, specifically states that the filter material, which is not on the bottom of a vessel, has pores sized so that the cells of interest **cannot pass through the filter material** (Col. 7, lines 54-55). Thus, one of skill in the art reading Yaremko would have no motivation to look to Burshteyn for an alternative filter material, since the basis of Yaremko is to allow reacted components to **pass through the filter material to achieve size separation**. Thus, Burshteyn should not be combined with Yaremko to provide the filter material of claim 1.

Even if the Office maintains the position that Yaremko and Burshteyn are a proper combination under 35 USC 103, the combination still fails to obviate the system of claim 1. Due to the specific requirements in Yaremko that the reacted components **pass through the filter material** for size separation, this effectively teaches away from the claimed system where the filter material substantially prevents reacted components from passing through the filter material. A claim cannot be deemed obvious in view of a reference if the reference “teaches away” from the claim. See *In re Gurley*, 2 F.3d 551, 31 USPQ2d 1130, 1131 (Fed Cir. 1994). Specifically, “[a] reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant....” *Id.* (emphasis added). In the instant case, one of ordinary skill in the art reading Yaremko would be led away from the use of a filter material such as that provided in the instant claims or in Burshteyn because such filter material would defeat the purpose of the system of Yaremko to separate the reactants by size by allowing the reactants of various sizes to **pass through** the filter material. This purpose is set forth in several passages of Yaremko, as discussed above (Col. 1, line 35 to Col. 2 line 15, Col. 6 lines 21-31, and col. 15, line 3).

Thus, to use the claimed filter material would negate the purpose of Yaremko to allow reactants to pass through the filter material to achieve size separation for detection of agglutination. If a reference would be ‘rendered inoperable for its intended purpose’ when it is modified for use as prior art, then the reference ‘teaches away’ and should not be used. *In re Gordon*, 733 F.2d 900, (Fed. Cir. 1984). See also *In re Fitch*, 972 f.2d 1260 (Fed. Cir. 1992). Therefore, the Yaremko reference teaches away from the use of a filter material configured to cause the reactants to

spread out over the uneven surface and to substantially prevent reacted components from passing through the filter material as recited in claim 1.

Moreover, since the reactants of Yaremko pass through the filter material, they are not spread out evenly over the uneven bottom surface as in the system of claim 1. Burshteyn fails to remedy these deficiencies of Yaremko, since Burshteyn also does not teach the spreading of reacted components over the bottom surface of a vessel. In particular, the filter material of Burshteyn is not even in the vessel 16; instead the filter material of Burshteyn forms a cylindrical tube 60 through which the sample passes, the filter material thus forming the sidewalls of the cylindrical tube/lumen 66. Plus, as discussed above, one of skill in the art would not be motivated to modify Yaremko by using the filter paper of Bushteyn, which is specifically taught to have pores sized to prevent cells of interest from passing through (see above and Bushteyn, col 7, lines 54-55), because to do so would render the purpose of Yaremko moot.

Thus, neither Yaremko nor Burshteyn, alone or in combination disclose, teach, or suggest, a reactant vessel having a bottom with an uneven surface comprising a filter material which provides the uneven bottom surface and is configured to cause reacted components to ***spread out over the uneven bottom surface while substantially preventing reacted components from passing through the filter material.***

Furthermore, neither Yaremko nor Burshteyn disclose, teach, or suggest an immunological assay system where interactions between components in the assay sample are evidenced by agglutination, with a flow cytometer or a capillary cytometer. In Yaremko a camera is used to detect and distinguish the size of reactant particles based on size separation. And in Burshteyn, a flow cytometer can be used but does not disclose detection of agglutination. Due to the presence of the reacted components of Yaremko in a gel or bead filtration material within a microcolumn, analysis of agglutination in a flow cytometer would be difficult. One of the advantages of the claimed system is that, due to the spreading out of the reacted components over the uneven bottom surface of the vessel, subsequent analysis with a flow cytometer is optimized. Thus, Applicants submit that due to the difficulty of using a flow cytometer for analysis of the reacted components of Yaremko dispersed within a filter material in a microcolumn, one of skill in the art would not be motivated to use a flow cytometer for analysis of agglutination. Thus, one of skill in the art would not combine the teachings of Burshteyn with the system of Yaremko with respect to the use of a flow cytometer. Thus, neither reference discloses using a flow or capillary cytometer to detect agglutination.

Based on the foregoing, Applicants respectfully submit that claim 1 is not obvious in view of the teachings of Yaremko and Burshteyn, either alone or in combination. Because

independent claim 1 is allowable, then for at least this reason, dependent claims 3, 5, 8, and 10-13 are also allowable. In *re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988). Applicants therefore respectfully request that the rejection of these claims be withdrawn as well.

Claim 15

Claim 15, as amended, reads in pertinent part as follows:

An immunological assay system, comprising:
a reaction vessel comprising a bottom with an uneven surface,
wherein the bottom of the vessel comprises a filter material chosen from
**...wherein the filter material provides the uneven bottom surface and
is configured to cause reacted components to spread out over the
uneven bottom surface while substantially preventing reacted
components from passing through the filter material...**

[Emphasis added]. Applicants respectfully submit that neither Yaremko nor Burshteyn, taken alone or in combination, teach at least the highlighted portions of claim 15 above. In particular, as discussed for claim 1, above, Applicants submit that the art of record fails to teach, suggest, or disclose a filter material providing an uneven bottom surface of a vessel, where the filter material is configured to cause the reacted components to spread out over the uneven bottom surface and substantially prevent reacted components from passing through the filter material. As discussed above, Yaremko specifically teaches that the reactants pass through the filter material for the purpose of size separation and therefore teaches away from a filter material that substantially prevents reacted components from passing through. Moreover, the filter material of Yaremko would not cause the reacted components to spread out over the surface, instead the reactants pass through the filter material. While reacted components may be dispersed within the filter material of Yaremko, they are not spread out over the surface of the uneven bottom surface provided by the filter material of the claimed system. Moreover, as set forth above, one of skill in the art would not be motivated to combine Yaremko with the teachings of Burshteyn to provide the claimed filter material, and even if combined, Yaremko still teaches away from the claimed system and Burshteyn fails to remedy all of the deficiencies of Yaremko. Thus, Applicants submit that claim 15 is nonobvious over and allowable over Yaremko alone or in view of Burshteyn for at least these reasons and for the reasons set forth for claim 1 above.

Because independent claim 15 is allowable, then for at least this reason, dependent claims 18-22 are also allowable. In *re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988). Applicants therefore respectfully request that the rejection of these claims be withdrawn as well.

Claims 23 and 39

Claim 23, as amended, reads in pertinent part as follows:

An immunological assay method comprising:
providing a vessel having a bottom with an uneven surface, wherein the bottom of the vessel comprises a filter material chosen from ...**wherein the filter material provides the uneven surface and substantially prevents interacted components from passing through the filter material...**
centrifuging the sample and reagent mixture in the vessel,
wherein the uneven surface causes the interacted components in the sample to spread evenly over the bottom surface of the vessel during centrifugation, without migrating to a single area within the vessel...

[Emphasis added]. Applicants respectfully submit that neither Yaremko nor Burshteyn, taken alone or in combination, teach at least the highlighted portions of claim 23 above. In particular, as discussed for claim 1, above, Applicants submit that the art of record fails to teach, suggest, or disclose a filter material providing an uneven bottom surface of a vessel, where the filter material substantially prevents reacted components from passing through the filter material. As discussed above, Yaremko specifically teaches that the reactants pass through the filter material for the purpose of size separation and therefore teaches away from a filter material that substantially prevents reacted components from passing through.

Moreover, Yaremko fails to teach that the uneven surface provided by the filter material causes the interacted components to **spread evenly over the bottom surface of the vessel during centrifugation, without migrating to a single area within the vessel**. The filter material of Yaremko would not cause the reacted components to spread out over the surface, instead the reactants **pass through the filter material**. While reacted components may be dispersed within the filter material of Yaremko, they are not spread out over the surface of the uneven bottom surface provided by the filter material in the claimed method. Moreover, as set forth above, one of skill in the art would not be motivated to combine Yaremko with the teachings of Burshteyn to provide the claimed filter material, and even if combined, Yaremko still teaches away from the claimed method, and Burshteyn fails to remedy all of the deficiencies of Yaremko. Thus, Applicants submit that claim 23 is nonobvious over and allowable over Yaremko alone or in view of Burshteyn for at least these reasons and for the reasons set forth for claim 1 above.

Claim 39, as amended, reads in pertinent part as follows:

An immunological assay method, comprising:
mixing a diluted immunohematological sample with a diluted reagent to form a sample mixture in a vessel with an uneven bottom surface, **wherein the uneven bottom surface of the vessel comprises a filter material having a bottom surface immediately adjacent a bottom of the vessel and an uneven top surface**, wherein the filter material is chosen from ...
spreading the sample mixture over the top surface of the filter material through low speed centrifugation in order to facilitate interactions between reaction components, while substantially preventing reacted components from passing through the filter material.

[Emphasis added]. Applicants respectfully submit that neither Yaremko nor Burshteyn, taken alone or in combination, teach at least the highlighted portions of claim 39 above. In particular, as discussed for claim 1, above, Applicants submit that the art of record fails to teach, suggest, or disclose spreading the sample mixture **over the surface of the filter material** (e.g., the uneven bottom surface of the vessel) while **substantially preventing reacted components from passing through the filter material**. As discussed above, Yaremko specifically teaches that the reactants pass through the filter material for the purpose of size separation and therefore teaches away from substantially preventing reacted components from passing through the filter material and/or spreading the sample mixture over the top surface of the filter material.

Specifically, the filter material of Yaremko would not cause the reacted components to spread out over the top surface of the filter material, instead the reactants in Yaremko pass through the gel or bead filter material, by design. The method of Yaremko would be rendered moot if the reactants spread out over the surface of the filter material, since the purpose is for reactants to pass through the filter material for size separation. While reacted components may be dispersed within the filter material of Yaremko, they are not spread out over the surface of the filter material as provided in the claimed method. Moreover, as set forth above, one of skill in the art would not be motivated to combine Yaremko with the teachings of Burshteyn to provide the claimed filter material, and even if combined, Yaremko still teaches away from the claimed method, and Burshteyn fails to remedy all of the deficiencies of Yaremko for at least the reasons set forth above for claim 1. In addition, neither Yaremko nor Burshteyn teach an uneven bottom surface of the vessel provided by a filter material having a **bottom surface immediately adjacent a bottom of the vessel and an uneven top surface**. Thus, Applicants submit that claim 39 is nonobvious over and allowable over Yaremko alone or in view of Burshteyn for at least these reasons and for the reasons set forth for claim 1 above.

Because independent claims 23 and 39 are allowable, then for at least this reason, dependent claims 24-29, 31, 33, 35-38, and 40-45 are also allowable. *In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988). Applicants therefore respectfully request that the rejection of these claims be withdrawn as well.

Claims 47-48

Claim 47, as amended, reads in pertinent part as follows:

An immunological assay system, comprising:
a vessel capable of containing an assay sample and a reagent,
wherein the vessel comprises a bottom with an uneven surface, ***wherein the uneven surface comprises a filter material immediately adjacent to the bottom of the vessel configured to substantially prevent reacted components from passing through the filter material and to cause reacted components in the assay sample to spread out on top of the uneven surface of the filter material***, wherein the filter material is chosen from...

[Emphasis added]. Applicants respectfully submit that neither Yaremko nor Burshteyn, taken alone or in combination, teach at least the highlighted portions of claim 47 above. In particular, as discussed for claim 1, above, Applicants submit that the art of record fails to teach, suggest, or disclose a filter material immediately adjacent to the bottom surface of a vessel, configured to ***substantially prevent reacted components from passing through the filter material***. As discussed above, Yaremko specifically teaches that the reactants pass through the filter material for the purpose of size separation and therefore teaches away from a filter material that substantially prevents reacted components from passing through.

Moreover, Yaremko fails to teach that the uneven surface provided by the filter material causes the interacted components to ***spread evenly on top of the uneven surface of the filter material***. The filter material of Yaremko would not cause the reacted components to spread out over the surface of the filter material, instead the reactants ***pass through the filter material***. While reacted components may be dispersed within the filter material of Yaremko, they are not spread out over the surface provided by the filter material as in the claimed method. Moreover, as set forth above, one of skill in the art would not be motivated to combine Yaremko with the teachings of Burshteyn to provide the claimed filter material, and even if combined, Yaremko still teaches away from the claimed method, and Burshteyn fails to remedy all of the deficiencies of Yaremko. Thus, Applicants submit that claim 47 is nonobvious over and allowable over Yaremko alone or in view of Burshteyn for at least these reasons and for the reasons set forth for claim 1 above.

Claim 48, as amended, reads in pertinent part as follows:

An immunological assay system, comprising:
a vessel capable of containing an assay sample and a reagent,
wherein the vessel comprises a bottom with an uneven surface,
wherein the uneven surface comprises a single piece of a filter material having a bottom surface immediately adjacent to the bottom of the vessel and a top surface configured to cause reacted components in the assay sample to spread out over the top surface of the filter material, wherein the filter material is chosen from

[Emphasis added]. Applicants respectfully submit that neither Yaremko nor Burshteyn, taken alone or in combination, teach at least the highlighted portions of claim 48 above. In particular, Applicants submit that the art of record fails to teach, suggest, or disclose a vessel bottom with an uneven surface, where the uneven surface comprises a **single piece** of a filter material having a **bottom surface immediately adjacent to the bottom the vessel** and a **top surface configured to cause reacted components in the assay sample to spread out over the top surface of the filter material**. As discussed above, Yaremko specifically teaches a gel or bead filter material, which is not a single piece of a filter material, since to use a single bead would not act as a filter material as required by Yaremko, which specifically teaches that the reactants pass through the filter material for the purpose of size separation. And a gel filter material would not provide an uneven surface.

Moreover, Yaremko fails to teach a filter material with a top surface configured that to cause the reacted components to **spread over the top surface of the filter material**. Yaremko teaches that the reacted components must **pass through the filter material**, not spread out over the top surface of the filter material. While reacted components may be dispersed within the filter material of Yaremko, they are not spread out over the surface provided by the filter material as in the claimed method. Moreover, as set forth above, one of skill in the art would not be motivated to combine Yaremko with the teachings of Burshteyn to provide the claimed filter material, and even if combined, Yaremko still teaches away from the claimed method and specifically the claimed filter material, and Burshteyn fails to remedy all of the deficiencies of Yaremko. In addition to the reasons set forth above, Burshteyn fails to disclose a single piece of a filter material with a bottom surface immediately adjacent to a bottom surface of a vessel and a top surface configured to cause reacted components to spread out evenly on this surface. Thus, neither reference alone or in combination meets the claim elements. Thus, Applicants submit that claim 48 is nonobvious over and allowable over Yaremko

alone or in view of Burshteyn for at least these reasons and for the reasons set forth for claim 1 above.

CONCLUSION

In light of the foregoing amendments and for at least the reasons set forth above, Applicants respectfully submit that all objections and/or rejections have been traversed, rendered moot, and/or accommodated, and that the now pending claims are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested.

Any other statements in the Office Action that are not explicitly addressed herein are not intended to be admitted. In addition, any and all findings of inherency are traversed as not having been shown to be necessarily present. Further, any and all findings of well-known art and official notice, or statements interpreted similarly, should not be considered well known for at least the specific and particular reason that the Office Action does not include specific factual findings predicated on sound technical and scientific reasoning to support such conclusions.

As proposed in the telephone interview between Examiner Handy and Applicants' attorney on October 30, 2007, Applicants respectfully request that the Examiner call the undersigned attorney to set up another telephone interview of this case upon review of the present amendments and remarks.

Respectfully submitted,

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